

Pascagoula Health Survey

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Date: January 23, 2021

The Health Survey was completed by residents of Cherokee Subdivision in Pascagoula, Jackson County, Mississippi. Cherokee Subdivision consist of 150 houses, with 20 empty houses.

A total of 80 individuals were surveyed, 54% female, 44% male and 2% unidentified. The ages ranged from 3 to 80 years old. The ages by sex ranged as follows:

Age	Male	Female
0-10	4	3
11-20	6	7
21-30	5	3
31-40	3	2
41-50	3	5
51-60	8	8
61-70	4	9
71-80	2	5

One individual sex and one individual age were unknown.

Years Community Members Lived at Current Address

Community members lived at their current addresses from 6 months to 52 years. The majority of community members surveyed lived in their current homes from 0 to 20 years.

Years	Surveyed Individuals
0-5 years	17
6-10 years	21
11-20 years	18
21-30 years	14
31-40 years	5
41-50 years	1
51-60 years	1
Unknown	3

Smoking History

85% of those surveyed never smoked

15% of those surveyed smoked

Those that smoked, smoked from 0.5 to 1 pack of cigarette a day, and have smoked from 4 years to 31 years with an average of 25 years of smoking history.

Seventeen (17) surveyed individuals smoked in the past from six months to 45 years, with an average of 18 years smoking in the past.

Occupations of Surveyed Individuals

Electrical Engineer
Design Specialist
Machine Operator
Dragline Operator
Pipe Welder
Ship Fitter
Shipyard Welder
Construction
Refinery Worker
Plummer
US Postal Service
Military Service
Realtor
School Administrator
Self Employed
Business Owner
Registered Nurse
Health Worker
Digestive Health
Medical Field
Miss. Sun Herald
Marketing Manager
Retail Sales
Nursery
Vending Cashier Waitress
Walmart
La Font Inn
McDonalds
Southern Belle
Raising Cane
Harrahs
Jerry Lee Store
Dollar General
Larry's BBQ
Seamstress
Housewife
Retired
Student

Healthy Versus Sick

52.5 % of surveyed individuals considered themselves **Healthy**

47.5 % of surveyed individuals considered themselves **Sick**

The surveyed individuals reported being sick from 0 to 30 days per month with an average of being sick 9.3 days per month.

Ten surveyed individuals reported being sick as frequently as every day per month.

Experience Odors

96% of the individuals surveyed experienced odors

4% of the individuals surveyed did not experience odors

How Frequently Are Odors Experienced

Two to 30 days per month, with an average of **22.6 days per month**.

Community Members Description of Odors

Crude Oil – 21 individuals

Gas – 18 individuals

Sweet Smell – 15 individuals

Sulphur – 14 individuals

Rotten Eggs – 14 individuals

Acid Smell – 13 individuals

Ammonia – 7 individuals

Chemical Smell – 6 individuals

Paint – 5 individuals
 Burnt Oil Smell – 5 individuals
 Fish Rotten Plant – 4 individuals
 Welding Fumes – 4 individuals
 Deadly – 4 individuals
 Rubber – 3 individuals
 Perfume – 2 individuals
 Unknown Chemical – 2 individuals
 Sour Smell – 2 individuals
 Bad Odor – 2 individuals
 Sand Blasting – 2 individuals
 Diesel – 1 individual
 Unpleasant Odor – 1 individual
 Sewage – 1 individual
 Cat Food – 1 individual

Community Members Health Impacts Associated With Odors

Health Impacts	Incidence
Sinus Problems	87%
Skin Rashes/Burning	73%
Burning Eyes	39%
Headaches	38%
Shortness of Breath	31%
Allergies	19%
Nausea	18%
Diarrhea	14%

Ears/Nose/Throat

ringing in Ears	23%
Loss of Sense of Smell	14%
Hearing Loss	14%
Persistent Hoarseness	14%
Discoloration of Teeth	6%
Metallic Taste on Cough	6%
Wheezing	4%
Nasal Irritation	4%
Sore Throat	4%
Deafness	3%
Sores in Mouth	1%
Frequent Nose Bleeds	1%

Skin

Eczema	6%
Boils	6%
Discolored Skin	1%
Skin Peeling	1%
Pustules on Skin	1%
Thickening of Skin	1%
Yellowing of Skin	1%
Burns of Skin	1%

Digestive System

Abdominal Pain	36%
Indigestion	9%
Muscle Weakness	8%
Change in Bowel Habits	4%
Loss of Sense of Taste	3%
Bowel Problems	1%
Weight Loss	1%
Blood in Stools	1%
Diverticulosis	1%
Gall Bladder	1%
Hernia	1%

Urinary

Frequent Urination	28%
Difficulty in Starting to Urinate	8%
Blood in Urine	6%
Gout	6%
Discolored Urine	4%
Sugar in Urine	1%
Urinary Tract Infection	1%
Bladder Disease	1%

Neurological

Forgetfulness	19%
Loss of Memory	14%
Amnesia	9%
Weakness of Hands	6%
Tingling in Hands	5%
Staggering	5%
Spelling Difficulties	4%
Stumbling	4%
Trembling Hands	2%
Dizziness	2%
Falling	2%
Difficulty Concentrating	1%
Seizures	1%
Trembling in Arms	1%
Learning Problems	1%

Pancreas

Diabetes	1%
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Behavioral Issues

Increase Fatigue	41%
Sleep Disturbance	23%
Sleep Disorders	7%
Tension	6%
Frequent Irritability	5%
Depression	4%
Loss of Sleep	2%

Loss of Sexual Drive	2%
Fainting	2%
Extreme Exhaustion	1%
Difficulty Carrying Out Actions	1%

Blood Disorders

Bleeding from Rectum	1%
Bleeding Ulcers	1%

Cancers

Skin Cancer	4%
Lung Cancer	4%
Abnormal Mammogram	1%
Bladder Cancer	1%
Breast Cancer	1%
Cervical	1%
Chronic Myeloid Leukemia	1%
Fibromyalgia	1%
Mesothelioma	1%
Prostate Cancer	1%
Thyroid	1%

Community Members Surveyed Identified Industrial Sources Where Odors Were Coming From

- VT Halter Marine – 40%
- Ingalls Shipyard – 34%
- Chevron Refinery – 31%
- Signal Shipyard – 31%
- Mississippi Phosphate – 29%
- First Chemical – 28%

Facilities Releasing Sources of Pollution into the Air, Identified by Surveyed Community Members

VT Halter Marine – 70%

Chevron Refinery – 69%

First Chemical- 49%

Mississippi Phosphate- 43 %

Signal Shipyard – 43 %

Ingalls Shipyard – 5%

Industrial Facilities

Chevron Pascagoula Refinery

The refinery began operations in 1963. Over the years of operation, the facility added various units to increase production capacity, process high sulfur crude, produce low sulfur gasoline and diesel and in 2020 streamlined and reduced production to compensate for less demand for products.

First Chemical

First Chemical was established in 1967. The facility manufactures aniline, nitrobenzene and NDPA lube antioxidant. In July 2020, First Chemical announced it would close the plant at the end of 2020.

Ingalls Shipyard

Ingalls Shipyard was founded in 1938 and has been in operation for 82 years. It is the largest employer in Mississippi. It is the largest supplier of US Navy Surface Combatants and has built nearly 70% of the US Navy Fleet of warships.

Mississippi Phosphate

The facility was founded in the late 1950's. It manufactured Diammonium Phosphate fertilizer from the late 1950's through December 2014 when it declared bankruptcy. At that time more than 700 million gallons of acidic, nutrient-rich wastewater was stored at the facility. The Environmental Protection Agency designated the site as a Superfund site and is addressing the contamination situation at the site. In July 2020, EPA completed Phase One of the first of three phases to close the site.

Signal Shipyard

Signal Shipyard performs ship building and repairs on platforms and barges.

VT Halter Marine

The facility was founded in 2002 and designs and constructs ship for public and private clients, including the Department of Defense. On January 7, 2021, the company announced they will build the first Polar Security Cutter for the US Coast Guard. It will be the next generation of heavy icebreakers to be used in Antarctica.

Environmental Protection Agency Toxic Release Inventory – 2019

The state of Mississippi ranked 12 out of 56 states and territories in the United States, in total releases per square mile in 2019.

Air Emissions - 906.4 thousand pounds

Ammonia	29%
Hydrogen Cyanide	10%
Toluene	7%
n-Butyl Alcohol	5%
n-Hexane	5%
Others	44%

Releases to Water – 202.2 thousand pounds

Nitrate Compounds	84%
Ethylene Glycol	5%
Vanadium	3%
Zinc Compounds	3%
Ammonia	2%
Others	2%

Jackson County Toxic Release Inventory - 2019

Air Emissions – 735.1 thousand pounds

Ammonia	18%
Hydrogen Cyanide	13%
Toluene	9%
n-Butyl Alcohol	6%
n-Hexane	6%
Others	48%

Releases to Water – 196.1 thousand pounds

Nitrate	86%
Ethylene Glycol	6%
Vanadium Compounds	4%
Zinc Compounds	1%
Methanol	1%
Others	2%

Chemicals Released into the Air from Industrial Facilities That Surveyed Community Members Identified as Being Sources of Odor Emissions and Sources of Pollution into the Air

- 2-Methoxyethanol
- 2-Nitrophenol
- 4-Nitrophenol
- 1,2-Dichloroethane
- 1,2-Dibromomethane

1,2-Dichloropropane
1,3-Butadiene
2,4-Diamioanisole
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
4,6-Dinitro-o-cresol
2,6-Xylidine
1,2,4-Trimethylbenzene
1,1,1-Trichloroethane
Acetophenone
Aluminum Oxide
Ammonia
Aniline
Barium Compound
Benzene
Benzo(g,h i)Perylene
Biphenyl
Carbon Disulfide
Carbonyl Sulfide
Certain Glycol Ethers
Chlorine
Cobalt Compounds
Copper Compounds
Chromium Compounds
Cresol
Cyclohexane
Cumene
Dichloromethane
Diethanolamine
Dioxin and Dioxin Like Compounds
Diphenylamine
Ethylbenzene
Ethylene
Formaldehyde
Hydrochloric Acid
Hydrogen Cyanide
Hydrogen Sulfide
Lead

Manganese
Manganese Compounds
Methanol
Methyl Ethyl Ketone
Mercury
Naphthalene
n-Butyl Alcohol
Nickel Compounds
Nitrate
Nitric Acid
Nitrobenzene
n-Hexane
o-Toluidine
Phenol
Polycyclic Aromatic Hydrocarbons
Propylene
Styrene
Toluene
Tert-Butyl Alcohol
Toluene
Vanadium
m,p-Xylene
o-Xylene
Zinc
Zinc Compounds

Health Impacts of Chemicals Released into the Air from Industrial Facilities That Surveyed Community Members Identified as Being Sources of Odor Emissions and Sources of Pollution into the Air

Acute Health Impacts

Irritation to the skin, eyes, nose, throat, lungs

Irritate and Burn eyes, skin, throat, nose

Causes shortness of breath, coughing, wheezing, headaches, dizziness, lightheadedness, bronchitis, nausea, vomiting, diarrhea, weakness.

Irregular heart beat, fatigue, affects concentration, memory, muscle cramps, loss of coordination, loss of memory, confusion, impacts to nervous system, passing out, slowed reflexes, rashes, itching, eye damage, pulmonary edema, weakness in hands and feet.

Chronic Health Impacts

2-Methoxyethanol – May be a Teratogen in humans since it has been shown to be a Teratogen in animals. May damage the liver and kidneys.

2-Nitrophenol – May damage liver. May affect nervous system.

4-Nitrophenol – High or repeated exposure may affect nervous system.

1,2-Dichloroethane – May be a Carcinogen in humans, shown to cause cancer of the blood vessel, lung, breast in animals. May affect the liver and kidneys.

1,2-Dichloroethane – May be a Carcinogen in humans since it has been shown to cause blood vessel, lung, breast and other types of cancers in animals. May damage the liver and kidneys. Effects may include reduced memory and concentration, personality changes, reduced coordination, effects on nerves supplying internal organs.

1,2-Dichloropropane – Limited evidence it can cause cancer in animals. It may cause cancer of the liver. Repeated exposure may damage the liver and kidneys. May affect the nervous system.

1,3-Butadiene – Probable Carcinogen in humans. Some evidence it causes lymph, breast, uterine, lung, heart and skin cancer in animals.

2,4-Diaminoanisole – Maybe a Carcinogen in humans since it causes cancer of the thyroid in animals. Limited evidence it is a Teratogen in animals. Treat as a possible Teratogen in humans. May damage the liver and affect the thyroid.

2,4-Dimethylpneol – High or repeated exposure may affect the liver and kidneys.

2,4-Dinitrophenol – May damage liver, kidneys, nervous system and blood cells.

2,4-Dinitrotoluene – May be a Carcinogen in humans. Causes mammary and skin cancer in animals. May damage male (testes) reproductive system in animals.

2,6-Dinitrotoluene – May be a Carcinogen in humans. Shown to cause liver cancer in animals. May damage male reproductive system (decrease sperm count) and affect male fertility in animals.

4,6-Dinitro-o-cresol – May cause mutations (genetic changes). Limited evidence may decrease fertility in males. May damage liver and kidneys and blood cells.

2,6-Xylidine – May be a Carcinogen in humans since it has been shown to cause cancer of the nose and liver in animals. May damage the liver.

1,2,4-Trimethylbenzene – May cause changes to blood cells and affect blood clotting ability.

Acetophenone – May affect the nervous system.

Aniline – Carcinogen in humans, causes spleen cancer in animals.

Barium – May damage the kidneys.

Benzene – Carcinogen in humans, causes leukemia, should be treated as a possible Teratogen, repeated exposure can cause aplastic anemia.

Carbon Disulfide – May be a Teratogen in humans since it is a Teratogen in animals. It decreases fertility in men and women, causing sperm abnormalities and spontaneous abortions.

Methyl Ethyl Ketone – Limited evidence may be a Teratogen in animals, damage to nervous system, may affect the brain.

Cobalt Compounds – Carcinogen in humans since it has been known to cause cancer of the muscle of animals. May damage male reproductive system (decrease in sperm count).

Copper Compounds – May decrease fertility in males and females.

Cresol – May damage the liver and kidneys.

Cyclohexane – May damage liver and kidneys.

Cumene – May damage liver and kidneys.

Diethanolamine – Limited evidence may damage male reproductive system (decrease sperm count) in animals. May affect the liver and kidneys.

Diphenylamine – May damage developing fetus. May affect bladder. May affect liver.

Ethylbenzene – May be a Carcinogen in humans since it has been shown to causes cancer of the kidneys, testes, lung and liver in animals. There is limited evidence that it is a Teratogen in animals. Treat as a possible Teratogen in humans. It may damage the developing fetus and may affect male and female fertility.

Formaldehyde – Causes cancer in humans. Causes cancer of the nasopharynx and leukemia. Limited evidence may damage the developing fetus and affect female fertility.

Hydrogen Sulfide – Limited evidence causes spontaneous abortions.

Lead – Probable Carcinogen in humans. Some evidence causes lung, stomach, brain and kidney cancer in humans. Shown to cause kidney cancer in animals. A Teratogen in humans since it is a Teratogen in animals. Decreases fertility in males and females and damages developing fetus and the testes.

Methyl Ethyl Ketone – Limited evidence it is a Teratogen in animals. Treat as a possible Teratogen in humans.

Methylene Chloride – May be a Carcinogen in humans. Shown to cause liver and lung cancer in animals. Limited evidence causes spontaneous abortions. May damage the liver and affect the kidneys.

Mercury – Limited evidence may cause an increase in spontaneous abortions, menstrual disorders in expose women. Limited evidence may affect male fertility. May damage developing fetus in animals.

Naphthalene – Probable Carcinogen in humans. Evidence causes cancer of the larynx and intestines in humans. Known to cause nasal and lung cancer in animals. Limited evidence may damage developing fetus.

n-Butyl Alcohol – Limited evidence it is a Teratogen in animals, treat as a possible Teratogen in humas. May damage liver and kidneys.

Nickel Compounds – Probable Carcinogen in humans. Evidence it causes lung cancer in humans. It has been suspected to cause lung cancer in animals.

Nitrobenzene – May be a Carcinogen in humans since it has been shown to cause lung, thyroid, liver and kidney cancer in animals. May damage testes (male reproductive organ). May damage the liver and affect blood cells.

n-Hexane – May damage testes (male reproductive organ).

o-Toluidine – Probable Carcinogen in humans. Shown to cause bladder and liver cancer in animals.

Phenol – A mutagen. Limited evidence may damage the developing fetus in animals.

Styrene – May be a Carcinogen in humans. Shown to cause lung cancer in animals.

Toluene – May be a Teratogen in humans, since it is a Teratogen in animals. May damage developing fetus. May cause liver, kidney and brain damage.

Vanadium – Limited evidence may damage the male reproductive system in animals. May damage the kidneys.

Xylene – May damage developing fetus. May damage liver and kidneys.

Zinc – Appears to affect the male reproductive system (including sperm count).

Summary

A total of 70 toxic industrial chemicals (organics, inorganics and heavy metals) have been reported to the regulatory agencies by the industrial facilities in the Pascagoula area, as being released into the air. The chemicals are reported to the Environmental Protection Agency and the Mississippi Department of Environmental Quality as part of the Toxic Release Inventory and air permitting requirements.

Many other industrial chemicals are not required to be reported to the regulatory agencies, but are released by the industrial facilities into the air.

The acute (short term exposure) and chronic (long term exposure) health impacts associated with the 70 chemicals released by the industrial facilities into the air, match the health impacts reported by community members in the survey as a result of exposure to odor events and in addition to the odor events.

The cumulative impacts to community members inhaling the chemicals released into the air in the area, add to the negative health impacts experienced by community members.